

CLAIMS

What is claimed is:

1. An m-to-n multicast concentrator for routing input signals, each of the input

5 signals being 0-bound, 1-bound, bicast, or idle, the concentrator comprising

m input ports to receive the input signals,

m output ports partitioned into two groups wherein m-n of the m output  
ports are grouped as a 0-output group and the remaining n output ports are grouped as a  
1-output group, and

10 means, responsive to the input signals, for routing a maximum total number  
of 0-bound and bicast ones of the input signals to the 0-output group and the maximum  
total number of 1-bound and bicast ones of the input signals to the 1-output group.

2. A method for self-routing input packets in an m-to-n multicast concentrator, the

15 multicast concentrator having m input ports to receive the input signals, m output ports  
partitioned into two groups wherein m-n of the m output ports are grouped as a 0-output  
group and the remaining n output ports are grouped as a 1-output group, and a multi-stage  
interconnection network of bicast cells, each of the input packets being 0-bound, 1-bound,

bicast, or idle determined by a routing tag in a packet header, the method comprising

configuring each of the bicast cells, in response to the two input packets

arriving at said each of the bicast cells are in a specified combination such that one of the

input packets is a bicast packet and the other is an idle packet, to produce a copy of the

5 bicast packet at each of the two output ports of said each of the bicast cells,

modifying the routing tag of the copy of the bicast packet produced at the

output-0 group such that the routing tag indicates that the copy is a 0-bound packet, and

modifying the routing tag of the copy of the bicast packet produced at the output-1 group

such that the routing tag indicates that the copy is a 1-bound packet, and

10 configuring each of the bicast cells, in response to the two input packets at

the said each of the bicast cells wherein the combination of the two packets is other than the

specified combination, to sort the two input packets with respect to the partial order

“‘0-bound’  $\prec$  ‘idle’  $\prec$  ‘1-bound’ and ‘0-bound’  $\prec$  ‘bicast’  $\prec$  ‘1-bound’”.

15 3. A method for implementing an m-to-n multicast concentrator with reference to

the network topology of an m-to-n concentrator, the m-to-n concentrator having m-n

output ports grouped as a 0-output group and n output ports grouped as a 1-output group

and being constructed from a multi-stage interconnection network of sorting cells, the

method comprising

constructing a multi-stage interconnection network of nodes having the

same network topology as the multi-stage interconnection network of the m-to-n

concentrator, and

5 filling each of the nodes of the constructed network with a bicast cell.